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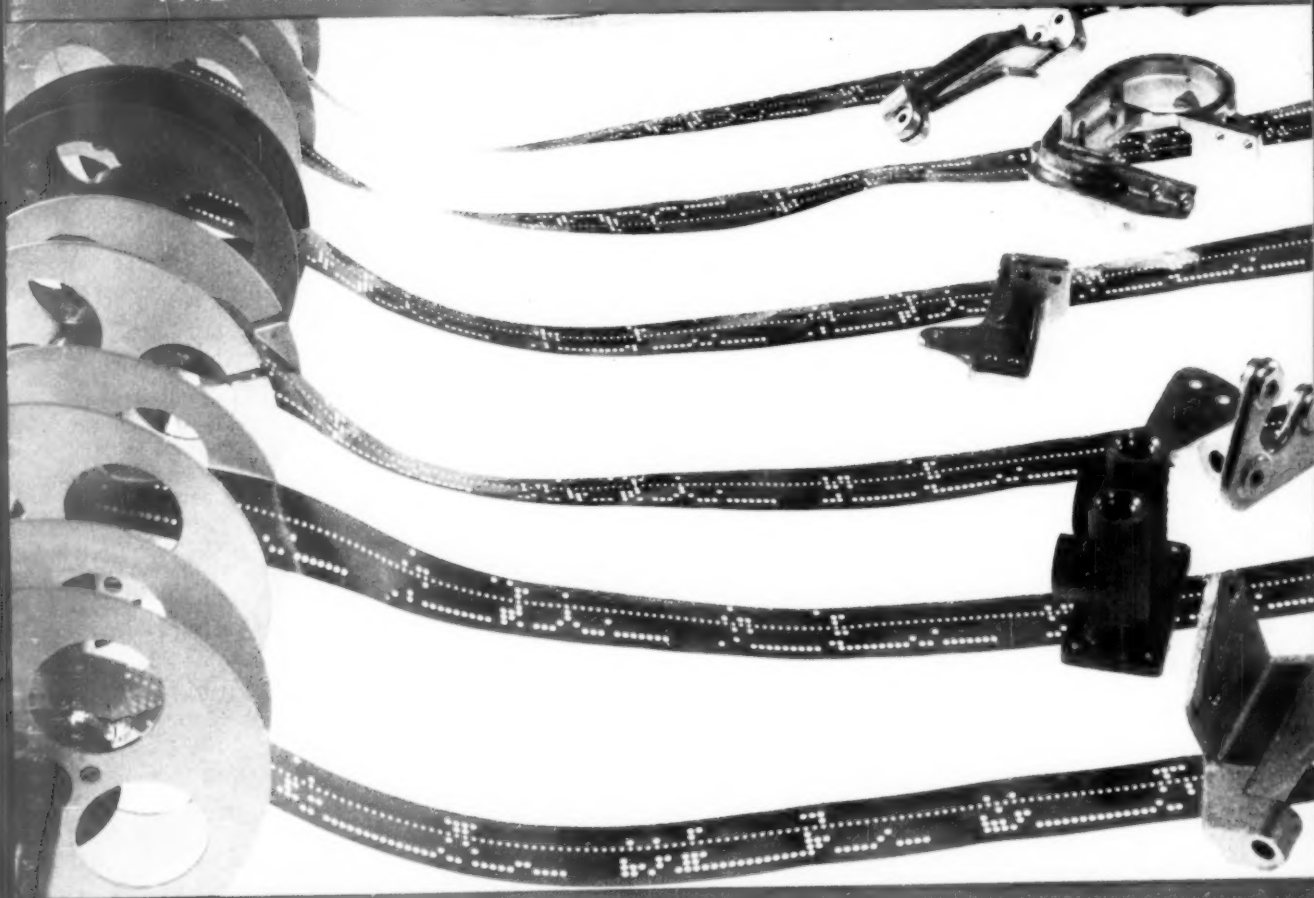
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March 22, 1958

VOL. 73 NO. 12 PAGES 173-191

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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MEDICINE

Study Cancer "Vaccine"

Evidence points to the possibility that some unknown product of the cancer cell may cause the body to produce antibody-like substances that in turn attack the cancer cell.

▶ AN ANTI-CANCER vaccine may eventually result from research evidence uncovered by Veterans Administration Hospital doctors at McKinney, Texas.

A natural defense mechanism of the body against cancer, resembling the reaction that makes polio and other vaccines possible, seems to be present in the body, Dr. Russell H. Wilson of the VA hospital has found.

The work has been based on findings by James W. Finney, research microbiologist, indicating that, under certain circumstances, products from cancer cells may cause the body to produce substances, perhaps antibodies, that may travel through the blood stream and attack the cancer cells.

Other workers on the project include Dr. Dale A. Clark, research biochemist, and Dr. William L. DeGinder, radiologist. They are working with both tissue cultures and volunteer patients, Dr. Wilson said.

The cancer tissue is removed by surgery and processed to obtain certain proteins. These proteins are then injected into the patient to stimulate production of the blood

substances doctors suspect might act against cancer cells.

After blood tests to determine how much the patient is reacting to these proteins, blood is taken from the patient and the blood substance that is active against cancer is separated.

Dr. Wilson reports that, when some of the anti-cancer blood substance is injected into the patient, there is sometimes a noticeable decrease in the size of the tumor mass.

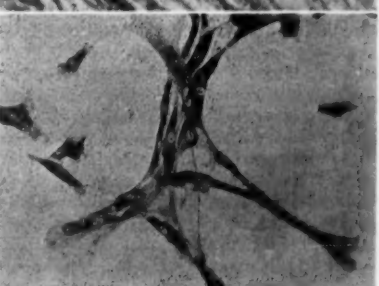
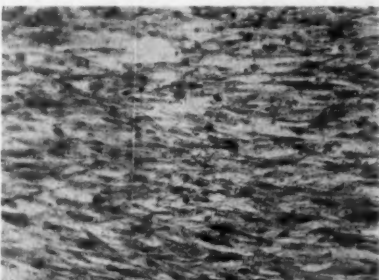
He said the research group now plans to attempt to isolate, from both tumors and the blood itself, the specific substance or substances responsible for the effects.

Doctors long have been puzzled by the fact that when cancer is treated with X-ray, occasionally other cancers which have spread to different parts of the body from the parent growth tend to decrease in size even though they receive no X-rays. In addition some cancer growths spontaneously decrease in size or stop growing and cause no harm for years.

Science News Letter, March 22, 1958

Pasolina Ingenito, research associate in preventive medicine; Dr. John M. Craig, assistant professor of pathology; and Dr. Marcellow Martinelli, Lederle Research Fellow in preventive medicine from the University of Bologna, Italy.

Science News Letter, March 22, 1958



ARTERY CELLS—Microphotographs of tissue cultures of human aortic cells show the effects of different fatty deposits. Normal tissue appears at the top. Then, a steroid, cholesterol, is added, causing fat deposits and cell enlargement; next, an unsaturated fatty acid, linolenic acid, causes no fatty deposit when added with cholesterol; last, a saturated fatty acid, stearic acid (found in animal fats), is added along with cholesterol, causing a marked increase in fat deposition.

MEDICINE

Reverse Atherosclerosis

▶ **ATHEROSCLEROSIS**, the nation's single biggest killer, can be reversed, a team of Harvard Medical School scientists headed by Dr. David D. Rutstein has found.

The research team has also demonstrated that the deposit of fatty substances in the inner lining of arteries can either be prevented with unsaturated fatty acids or aggravated with saturated fatty acids.

Through the development of a new approach using tissue culture methods, the Harvard team has now made it possible for scientists to observe directly the point where fatty substances enter cells grown from human arteries.

Atherosclerosis is the disease in which fatty substances are deposited in the inner lining of the arteries. When this happens, the walls of the blood vessels are damaged and narrowed.

While conducting studies on rheumatic fever the scientists found that when cholesterol was used to determine the effect of a steroid hormone on human heart cells, the cells had granules that reacted as fats to chemical stains. This observation led to new studies on lipid or fat deposition in tissue cultures of human aortic lining in a medium containing human blood serum.

From this followed the direct observations of the laying down of fatty substances in the blood vessel cells.

Some of the cultures were kept on the same food. Others, however, were fed cholesterol, either in alcohol solution or

bound to a protein as in human blood.

Within four or five days, in those cultures to which cholesterol was added, a deposit of fat was noted and the cells became enlarged. The amount of fatty substance deposited was directly proportional to the amount of cholesterol added to the medium.

It was also seen that cells containing the fatty material placed in normal cholesterol-free medium lost the fat deposits and regained their normal size. On the other hand, if the cells remained in the cholesterol medium, the fat deposit continued to increase until the cells died.

According to Dr. Rutstein and his associates, the deposit of fatty material in the cells produced by the added cholesterol could be prevented by adding linolenic acid, an unsaturated fatty acid found in corn oil, soybean oil, fish oils, peanut oil or cottonseed oil.

The deposit of fat in the cells could be markedly increased by a saturated fatty acid, such as stearic acid found in butterfat, coconut oil, animal fats and shortening, when added at the same time the cholesterol was added to the medium.

The scientists who reported their work in the current issue of the British medical journal *Lancet* believe they have opened the way to direct studies of the mechanism of atherosclerosis.

In addition to Dr. Rutstein, who heads Harvard's department of preventive medicine, the research team included Dr. Estelle

PUBLIC SAFETY

Future Disasters Threaten

Famine, earthquakes, epidemics and plagues, floods and hurricanes, insects and insecticides continue to threaten man, along with the new dangers of atomic disaster.

► **THE WORLD** can expect major disasters, even without war.

Accidental atomic disasters, such as might have occurred had the atomic bomb that dropped near Florence, S. C., on March 11, been armed, add a significant new dimension to the world's vulnerability to disasters.

But atomic or hydrogen weapon disasters, intentional or accidental, are by no means the only disasters the world faces in the future.

Disasters have been becoming worse and more frequent in recent years. This is pointed out by Capt. Walter S. Diehl, U.S. Navy, Retired, and a Washington, D. C., consulting engineer, who has written a scientific paper for the *Washington Academy of Sciences* (Dec. 1957).

What is more frightening, perhaps, is that there is every reason to believe that they will become still worse in the future.

Capt. Diehl defines a disaster as an event that kills a large number of people at one time. Disasters are becoming more frequent because the population of the world is increasing rapidly. There are more innocent bystanders these days whenever disaster strikes, and the very fact that the population is larger makes some kinds of disaster more likely.

The rarest of the 22 kinds of possible disaster listed by Capt. Diehl, is the one recorded case of "geological explosion." This occurred in 1348 when Mount Dobratz in Austria suddenly "exploded," killing thousands of people. The Mount Dobratz explosion was not an earthquake, and its cause has never been explained.

Seven types of disaster are singled out by Capt. Diehl as being potentially dangerous to the largest number of people. The most widely discussed are the results of atomic fallout or by-products from reactors, and the dangers of atomic warfare.

Famine, resulting from drouth and crop failure, is already a severe check on population in countries such as China and India where most people live at a bare subsistence level. Insects have serious disaster potential because man has violently upset the balance of nature. The insecticides now in use are frequently poisonous to man as well as insects.

The widespread use of processed food has a potential for large-scale disaster if any of the additives in food processing should turn out to have very long-range toxic effects. Epidemics and plagues have been brought under control but the margin of control is small. New York City had a bad smallpox scare in recent years.

Finally, the climate of the world has changed radically in the past. If such a change occurred again now, large parts of the world population could die of famine.

Lives lost through regularly recurring natural disasters such as hurricanes, floods, blizzards, and earthquakes, are certain to increase, Capt. Diehl points out, because the population continues to increase in the danger spots.

Housing developments have been built below the high-water mark of dry river beds, for example, and some large communities are located on known active earthquake faults. Even where protective measures can be taken, people usually are unwilling to pay the price. They would rather take their chances on an earthquake than go to the expense of building an earthquake proof house.

Other types of disaster are rare yet can cause extreme damage. It is impossible to predict a large meteorite like the one that levelled many square miles of forest near Lake Baikal in Siberia in 1918, or an earthquake in a normally inactive area like the Charleston, S. C., earthquake of 1886.

Yet comparable disasters will certainly recur. As the world fills up with people there will be more and more chance of their occurring in a very heavily populated area and taking a larger toll of human life.

Science News Letter, March 22, 1958

ARCHAEOLOGY

Ancient "Magic" Figures Found in Grand Canyon

► **MYSTERIOUS** little twig figurines found in caves in the Grand Canyon may have been used in prehistoric Indian magic to bring success in hunting more than 3,000 years ago.

Description of the little wooden animals and the archaeologists' guess at the purpose to which they may have been put is reported in *American Antiquity* (Jan.) by Dr. Douglas W. Schwartz of the University of Kentucky, Lexington, and his associates Drs. Arthur L. Lange and Raymond deSaussure of Newmont Exploration Ltd., Jerome, Ariz., and San Francisco, Calif.

The little animals ranged in height from two inches to 14½ inches. The bodies were from one and one-half to eight inches in length. They were found buried in caches in very inaccessible caves in the Redwall escarpment, the most prominent cliff of the Grand Canyon.

It seems unlikely that the animals were children's toys because no indication was found that the caves were used as human dwellings. Only a few other objects of human manufacture were discovered, the most spectacular of which was a hank of human hair about four inches long wrapped with string.

Some of the animals were found pierced

through with miniature wooden spears. This the archaeologists believe may indicate a ceremonial or ritual killing of the animal images to bring success in a coming hunt.

The animals were made by splitting a small stick for most of its length, bending the unsplit portion down to form the back leg and then winding the split portions around to form the body, front legs, neck and head. After their ceremonial killing they were taken to an inaccessible sacred cave and hidden away.

No evidence was found to indicate what prehistoric people may have made the little animals. It is thought from the radio-carbon date of two of the figures at more than 3,000 years that their makers may have been part of the widespread Desert Culture of the area.

Science News Letter, March 22, 1958

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ROCKETS AND MISSILES

Rocket Clubs Superfluous

Existing science clubs should be able to help the growing number of young amateur rocketry enthusiasts with the aid of technically trained personnel from industry and the military.

► NEW ROCKETRY clubs do not have to be organized to handle the swelling ranks of rocketry amateurs.

Current enthusiasm for amateur rocketry can best be handled within existing science clubs, and military reserve officers not on active duty should be allowed to act as community or school rocketry advisers as a means of earning points necessary to maintain their commissions.

Kendall K. Hoyt, executive director of the Association of Missile and Rocket Industries, Washington, D. C., said the formation of new clubs especially for amateur rocketeers "could have an adverse effect on the nation's efforts to train youngsters for tomorrow's science leadership."

School and community funds for science activities, which are already in short supply, would be watered down even further by the formation of new clubs to duplicate part of the job in which existing clubs are experienced.

"Besides," Mr. Hoyt stated, "high school teachers already have enough of a burden with extra-curricular activities without adding new clubs, and industrial concerns which have been generous in assigning their technical personnel to assist science clubs may rebel at being called upon for help by an expanding number of clubs."

In using research officers to back up teachers and scientists in community science club activities, Mr. Hoyt believes the Government would realize "an excellent return" on its multi-million dollar reserve program investment that many critics recently have called stagnant.

In order to maintain their commissions and earn retirement pay, reservists must accumulate 50 points per year through correspondence courses, reserve unit meetings, administrative work or by acting as instructors. Such officers can earn one point for any single day in which they devote at least two hours to an approved reserve activity.

They can provide a strong background of military safety know-how and organized discipline that is necessary in conducting amateur rocketry projects, Mr. Hoyt believes. In addition, through units organized at the community level, reservists can be the core of any campaign conducted to publicize science youth activities, arrange for needed funds or secure experienced technical assistance.

The reserve Air Force colonel compares his proposed program with the Civil Air Patrol Cadet program which he organized during World War II. "That," he said, "was a case of youngsters learning from military

veterans and at the same time preparing to meet a vital future need."

Mr. Hoyt told SCIENCE SERVICE he is "alarmed" at the growing number of rocketry groups.

"These youngsters are just hurting themselves by forming outside groups that tend to spread available funds and competent assistance too thin," he said, adding that "they are also hurting science career preparation efforts by focusing prime attention on rocketry and away from such vital pursuits as biology, medical research, basic physics and mathematics and other important fields."

He urged the Department of Defense to collect suggestions immediately from educators and youth leaders on how the reserve program can best cooperate with organized science clubs.

Miss Margaret Patterson, executive secretary of Science Clubs of America, said SCA is prepared to transmit any resulting plan and suggestions to the 18,000 affiliated science clubs, reaching 400,000 young scientists who could benefit.

Science News Letter, March 22, 1958

BIOCHEMISTRY

Last Step in Blood Clot Process Is Discovered

► THE WAY in which thrombin, the body's essential blood-clotting enzyme, carries out its function has been uncovered.

Drs. Koloman Laki and Jules A. Gladner of the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., who made the discovery, hope it will shed new light on hemophilia and other mysterious blood disorders.

Blood clotting is a complex process involving a series of biochemical steps, each dependent upon a previous one. Blood platelets rupture releasing certain factors which act on prothrombin in the blood. Prothrombin is then converted into its active enzyme, thrombin. Clotting cannot occur without thrombin.

The formation of thrombin is followed by the last step in clotting, the formation of fibrin from fibrinogen. Just how thrombin acts on fibrinogen to form the clot has not been understood until now.

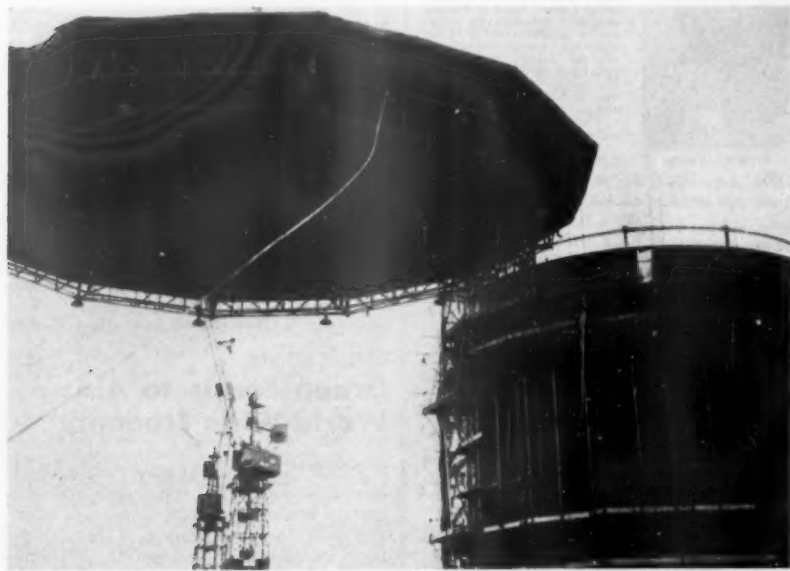
Drs. Laki and Gladner have found the "active site" on the thrombin molecule that is responsible for its action, and have discovered how thrombin changes fibrinogen to fibrin. Their findings are reported in the *Journal of the American Chemical Society* (March 5).

The scientists explain that the thrombin acts on the fibrinogen by rearranging the electric charges on the bonds of each molecule so that the fibrinogen molecules clump together as fibrin to form a clot.

The specific molecular bonds which thrombin split were previously unknown. The bonds are known as peptides.

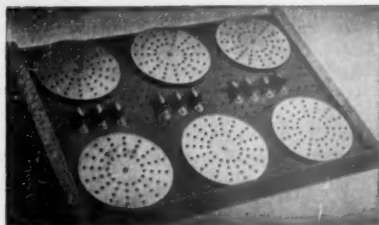
Further research revealed three other enzymes similar to thrombin also break down protein molecules by splitting the peptide bonds which hold them together. How the enzyme determines which peptide bonds it will break probably rests with the structure of the enzyme molecule itself.

Science News Letter, March 22, 1958



LID GOES ON NUCLEAR POWER STATION — A giant crane lifts on the temporary removable roof of the 100-foot, second pressure chamber of the Berkeley nuclear power station in Gloucestershire, England. The removable roof enables welding work to be done in all weathers. The power station is expected to be fully operational by 1961.

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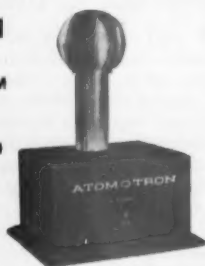
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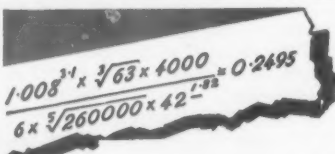
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ENGINEERING

"No-Hands" Factory Makes Defense Part

See Front Cover

► A "NO-HANDS" factory, automatically milling, drilling and boring vital parts for electronic defense systems, is in operation in Los Angeles, Calif.

The nation's first completely electronically controlled line of machine tools is operated from punched tapes and transistorized digital computers at a Hughes Aircraft Company plant adjoining International Airport.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows some of the special tapes used to produce machine tools electronically. The tool part appears on the tape that guides its production.

The automatic production line is designed to handle the majority of machining jobs in lots of a few hundred or less, with dimensions no greater than eight to 12 inches in any direction. This is in contrast to the specialized mass-production machining of automobile manufacturers.

The "building block" principle is employed in designing both machine tools and control system. Each machine tool is designed to fit in a standard space on an automated assembly line, so that any number and sequence of machines can be used side by side.

The system has a simple dial-correction method to compensate for machine-tool wear.

A very accurate method of measuring the distances the machines must travel to reach the proper spot has been devised. It is based on counting off the proper number of ten-thousandths of an inch on an electromagnetic measuring scale that moves with the machine.

Changes in operations may be introduced or production may be started on new parts merely by changing punched tapes and without stopping the machines.

Because the line is automatic, only one operator is needed. Control tapes can be punched by a typist after only a few hours' instruction. In the prototype system, the human operator needs only to place unmachined castings on the line and remove finished parts. But even this operation can easily be made automatic.

Science News Letter, March 22, 1958

GENERAL SCIENCE

Group Forms to Aid World-Wide Economy

► PERSONS interested in economic development and technical cooperation throughout the world have come of age professionally with the organization of the Society for International Development, Washington, D. C. Invitations to charter membership are being issued by an interim commission of which Gove Hambidge, formerly of the Food and Agriculture Organization of the United Nations, is executive secretary.

Science News Letter, March 22, 1958

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MEDICINE

Stress Adds to Heart Ills

➤ Occupational stress has been found to be the most prevalent of three contributing factors common to 100 sufferers of heart diseases, a ten-year study shows.

Heredity and fat consumption were the other two factors most frequently found to influence coronary disease.

Questions answered by the study, published in the *American Journal of the Medical Sciences* (March), include the problem of overwork and long hours. Over 90% of those in the experimental group, all between the ages of 25 and 40, had been under severe occupational stress for varying periods before the appearance of heart disease. All had hardening or narrowing of the arteries.

One-fourth of the patients held two jobs while another 46% worked at least 60 hours per week.

Others showed unusual fear, insecurity, discontent, frustration, restlessness or inadequacy in employment. The 100 subjects in the normal group did not experience any such emotional upset, according to the study.

Heredity, another factor which showed significant data, has long been linked with causes of heart disease. The study showed

67% of the patients had a history of some heart disease for one or both parents. However, a positive history is not a certain death certificate nor a negative history a guarantee of longevity.

More than half of the patients were accustomed to large amounts of fats in the diet, while regular exercise, or the lack of it, showed no correlation with normal health or early heart afflictions.

Tobacco smoking proved to be more prevalent among the heart group under study, and the patients were more addicted than the normal group. The heavy smoking habits of the patients appeared to be the result of heightened emotional strain rather than a direct cause of disease.

Overweight did not seem to play a significant role in the causal relationship, the study showed.

The study was conducted by Dr. Henry I. Russek, a consultant in cardiovascular research at the U. S. Public Health Service Hospital, Staten Island, N. Y., and Dr. Burton L. Zohman, associate professor of medicine at the State University of New York College of Medicine in Brooklyn.

Science News Letter, March 22, 1958

PSYCHOLOGY

Indians Had Dream Theory

➤ FREUD'S psychoanalytic theory of dreams was independently invented by the Iroquois Indians before the coming of the White Man.

Although the Iroquoian theory is not precisely the same as Freud's, the difference is not any more marked than the difference between the Jungian and Freudian varieties of psychoanalytic theory, Dr. Anthony F. C. Wallace, of the Eastern Pennsylvania Psychiatric Institute and the University of Pennsylvania, explains in the *American Anthropologist* (April).

"Over the course of nearly 300 years and probably longer, the Seneca—like the other Iroquois—have let dreams direct their lives," he said.

The Iroquois theory was described by one of the Jesuit fathers who began preaching the gospel to the Seneca nation in 1668. They found that the Seneca were particularly obstinate in looking to their dreams for guidance in all the important affairs of life.

The Iroquois recognized conscious and unconscious parts of the mind and dreams were believed to be the expression of desires that "come from the depths of the soul."

On awakening, the dreamer would tell his dreams and spare no pains to fulfill the desire revealed in the dreams. Or he might take his dreams to a clairvoyant to have them interpreted.

The Jesuit fathers were appalled at the thought that some Iroquois might dream of the priests' deaths and then have to kill to fulfill their desires. One Huron did dream

that he killed a French priest. He was appeased, however, by being given a French coat supposedly taken from the body of a dead Frenchman.

When a sick person dreamed, the whole village vied to give the sick person his every wish, for any frustration was a threat to life. A dying man might be surrounded by literally thousands of scissors, awls, knives, bells, needles, blankets, coats, caps, wampum belts, beads and whatever else was suggested by the sick man's fancy or the hopeful guesses of his friends.

If he died at last, "He dies," the people would say, "because his soul wished to eat the flesh of a dog, or of a man; because a certain hatchet that he wished for could not be procured."

If he survived, the gift of the last thing he wished for during illness was cherished for the rest of his life.

Science News Letter, March 22, 1958

TECHNOLOGY

Stretchable Paper Makes Better Bags

➤ HIGH STRENGTH paper that stretches to absorb shock instead of tearing can now be used to make grocery bags, cement sacks and heavy-duty wrappings.

Some supermarkets already are using the new grocery bags, which can be dropped more than 20 times without breaking when filled with an average load of groceries.

The new paper, called Clupak, is identical to present kraft papers except for the way in which fibers of the stretchable paper are intertwined to provide elasticity.

Fibers of ordinary kraft paper are "matted" like the felt in a hat. When a strain is applied, the fibers separate. In Clupak, the same fibers are "twisted and pushed together, similar to a person interweaving the fingers of his hands." Mechanically, the differences between the new paper and ordinary kraft paper are similar to the differences between a felt hat and a knitted sweater.

Clupak was developed from a basic process patented by Sanford Cluett of Cluett, Peabody and Company, developers of the "Sanforized" pre-shrinking process for fabrics. It will be licensed to paper manufacturers by a new company, Clupak, Inc., New York, organized jointly by West Virginia Pulp and Paper Company and Cluett, Peabody and Company.

Although Clupak costs 10% to 15% more than ordinary kraft papers, it is expected to be cheaper to use because bag manufacturers will be able to use just three layers of the new paper to achieve four-ply bag strength.

Tests show that multi-wall sacks made of the new extensible paper can withstand two to three times more punishment than similar sacks made of regular kraft paper.

Science News Letter, March 22, 1958



TWO BAGS FULL — Clupak paper bag survives a five-foot butt drop test intact, while regular bag, at the left, splits.

MEDICINE

Adrenal Glands May Help Cause Cancers

► **THE ADRENAL** glands, which help humans to overcome stress, may also help cause some kinds of cancer.

This has been indicated by research done by Dr. W. J. Eversole, University of New Mexico, Albuquerque, and Dr. John D'Amico, Princeton University, Princeton, N. J., and reported by the American Cancer Society.

The scientists were able to prevent the development of liver cancer in rats by removing the adrenal glands and injecting large doses of an artificial adrenal hormone called DCT, or desoxycorticosterone trimethylacetate.

Rats with adrenal glands or remnants of adrenal glands, whether given the hormone or not, always develop the liver cancer after four to five months of a diet which includes butter yellow.

The scientists removed the adrenal glands and gave the rats heavy doses of DCT. Five months later the treated rats showed little if any evidence of disease. Rats which still had their adrenals and had not received the DCT all had diseased livers by that time and many were dying of liver cancer.

Smaller doses of the DCT were also tried in adrenal-less animals. This slowed down the development of the cancer although it could not prevent cancer from occurring. The rats grew new adrenals from small accessory gland tissue, a fact which the researchers believe may explain the results.

Possibly, the large dose of DCT suppresses this accessory tissue, while low doses permit the tissue to begin producing the adrenal hormones which bring on the cancer.

The research has no direct application to human cancer at present, but it helps narrow the search for the chemical causes of at least some kinds of cancer, the Society reported.

Science News Letter, March 22, 1958

SURGERY

Find New Treatment For Angina Pectoris

► **THERE IS A** new surgical approach and technique for treatment of angina pectoris, severe pain in the chest, arm and heart, caused by heart disease.

Dr. Louis T. Palumbo, chief of the surgical service, Veterans Administration Center, Des Moines, Iowa, reported the technique will also help vascular insufficiency or inadequate blood supplies to the hand.

Angina pectoris, which occurs more frequently in men than women, is characterized by recurring attacks of severe chest pains, usually provoked by exertion or excitement. The pain sometimes radiates to the left shoulder and down the left arm, and death may even occur.

Dr. Palumbo told surgeons at a meeting of the International College of Surgeons and 23rd annual Congress of the United States and Canadian sections, Los Angeles, Calif., that the technique permits a complete removal of the sensory and motor pathways

from and to the heart. The operation is simpler and easier to perform than any other for this disease, he pointed out.

In addition, it completely or nearly completely relieves the disabling pain due to angina and also eliminates the undesirable action of the nerves which supply and control blood vessels of the heart muscle.

This leaves the patient free from the fear of the pain which formerly made him an invalid. The procedure carries a lesser risk and a lower operative complication rate than any other known procedure now advocated for angina.

"The interruption of both nerve pathways has a very favorable outcome in bringing about a more rapid rehabilitation of the patient with both freedom from disabling pain and allowance for the individual to carry on within the limits of his physical capabilities and cardiac reserves. Many patients previously incapacitated are now restored to a nearly normal socio-economic life without the need of the type of medications they were taking prior to surgery," Dr. Palumbo stated.

Results of this study have led to the introduction of a new concept concerning the sympathetic nerve pathways which control the pupil of the eye of man.

Science News Letter, March 22, 1958

MEDICINE

Researchers Devise TB Detecting Blood Test

► **A BLOOD** test to detect active tuberculosis has been developed by scientists at Northwestern University Medical School, the National Tuberculosis Association has announced.

This test, which will aid early diagnosis of TB, was difficult to devise because of the questionable role of antibodies in the disease.

The test is known as a double-diffusion precipitation technique. It was devised by Dr. Guy P. Youmans, head of the department of microbiology, and associates, Robert C. Parlett and Caroline Rehr, with the aid of Dr. William Lester of the Suburban Cook County Tuberculosis Association Sanatorium.

Live TB germs were introduced in a gelatine-like substance made from a seaweed base. This solidified after being pipetted into glass tubes. A second layer of gelatine without germs was introduced in the tube and solidified. The tube was then filled with blood serum to be tested for antibodies.

If the serum was from TB patients, a cloudy layer precipitated between the two layers of gelatine within a period of 48 to 72 hours. This precipitation is known as an antigen-antibody precipitate.

The advantage of the test lies in the fact that it is simple and reliable and can be carried out in hospital laboratories with a minimum of equipment, the scientists report in the *American Review of Tuberculosis and Pulmonary Diseases* (March).

A disadvantage, however, is that the method detects the TB antibodies but provides no measurement of the amount of any of the antibodies detected.

Science News Letter, March 22, 1958

IN SCIENCE

TECHNOLOGY

Report Method for Taking Pictures Using Heat

► **A NEW METHOD** of taking pictures using the heat radiated by the object has been developed.

The device is called a "thermal image converter." It will give photographs of objects only 27 degrees Fahrenheit warmer than the surrounding atmosphere, the scientists say in *Nature* (March 8).

The complete image converter consists of a self-supporting film of amorphous selenium that has been coated with metal on one side and is mounted in a vacuum at the focus of a parabolic mirror. The photograph is made by recording the amount of sodium light transmitted by the film.

For objects at temperatures more than 400 degrees Fahrenheit the aperture of the mirror must be reduced to avoid crystallization of the selenium.

Developers of the thermal image converter are Drs. W. R. Harding, C. Hilsum and D. C. Northrop of the Services Electronics Research Laboratory, Baldock, Herts, England.

Science News Letter, March 22, 1958

AGRICULTURE

Pesticides From 'Mums Found Safe and Potent

► **HARD ON** insects but easy on man and other warm-blooded animals is how the U.S. Department of Agriculture describes four new insecticides.

The new compounds all come from chrysanthemic acid, a man-made substance similar to an acid found in plants of the chrysanthemum family. They are related chemically to the already well-known pesticides pyrethrum and allethrin that are also derived from plant substances.

All these chemicals have "substantial lethal power over certain insects, yet a low toxicity to warm-blooded animals." The new insecticides, however, are even less deadly to animals, with toxicity as measured with rats ranging from one-eighth to one-third that of pyrethrum and allethrin, respectively.

USDA scientists report that the best two of the new compounds are equal to or better than the other plant derivatives when it comes to high levels of kill against the malaria mosquito, the codling moth, the southern armyworm and the body louse. Both these compounds, 6-chloropiperonyl chrysanthemate and 6-bromopiperonyl chrysanthemate, are slower in their action, however.

They are less effective than DDT and other chlorinated hydrocarbons, all of which may leave toxic residues.

Science News Letter, March 22, 1958

ICE FIELDS

OCEANOGRAPHY

Atlantic Loses 6,000,000 Tons of Water a Second

► SIX MILLION tons of water each second are lost by the North Atlantic, and exactly this amount is fed into the North Atlantic from below the equator.

This and other findings about the major ocean currents of the world are reported by Dr. F. G. Walton Smith of the International Oceanographic Foundation to the Smithsonian Institution, Washington, D. C.

The major currents circulate continually, making a clockwise circuit in the northern oceans and a counterclockwise one in the southern oceans. In general, the current flowing toward the pole on the western side of the ocean tends to be comparatively narrow and fast, whereas the corresponding current on the east, flowing toward the equator, is wide and slow.

Best known of these ocean rivers is the Gulf Stream. In the west it carries between 25,000,000 to 50,000,000 tons of water a second northward in a narrow stream flowing up to six knots. It crosses the North Atlantic, then veers southwestward off the coast of Africa, where it is known as the Canaries Current. To complete the circuit, it crosses the Atlantic again, very slowly, and spreads over a wide area.

The 6,000,000 tons poured each second across the equator is balanced by the water that leaves the surface and sinks below between Greenland and Iceland, in the Labrador Sea, and west of Gibraltar where the Mediterranean comes in contact with the Atlantic.

Each of these three downward movements removes from the surface about a third of that carried across the equator by the South Equatorial Current.

Science News Letter, March 22, 1958

MEDICINE

Cross Antibiotic Hurdle; Retention Problem Solved

► A LONG-SOUGHT method by which antibiotics can be improved in their effectiveness against infection, by raising their concentration and body retention time, has been found.

The method, reported in *Nature* (March 8), consists of combining familiar antibiotics, such as streptomycin and neomycin, with salts containing large molecules, to form compounds called antibiolympkins.

Drs. P. Malek, M. Herold, J. Hoffman and J. Kolc of the Institute for Antibiotic Research, Prague, Czechoslovakia, report that this combination produced a long-lasting concentration of the antibiolympkins in lymph nodes, the body's storehouse for germ warfare.

Previously, many antibiotics injected into the blood stream traveled to the lymph

nodes but remained only for a few hours and at an extremely low level of concentration.

The physiological characteristics of the antibiolympkins attract them to the lymph nodes. With them, they carry the beneficial antibiotics.

Another favorable result of the research concerns the reversal or reaction by the two types of germ fighting compounds.

Some antibiotics, when injected, result in immediate high concentration in the blood, while low in the areas needed, the lymph nodes. Antibiolympkins reacted in an opposite manner, concentrating in the lymph nodes, the scientists report.

They also point out that antibiolympkins showed "far less" toxic, or poisonous, effects than the antibiotics.

Antibiolympkins are compounds resulting from treatment of antibiotics such as streptomycin, neomycin, viomycin and streptomycin, with a wide range of naturally occurring organic acids.

Since antibiolympkins are specifically attracted to the lymphatic system, a higher concentration of antibiotics can be attained and stored and released at a more desirable rate in lymph nodes. Other antibiotics, when injected, circulate through the body by means of the blood stream which means high concentration but for a very short period of time.

Science News Letter, March 22, 1958

HORTICULTURE

Brown Lawns May be Dyed Green Safely

► IT IS perfectly safe to dye your brown lawn green.

Dr. Victor B. Youngner, turf-grass specialist at the University of California at Los Angeles, finds that green dyes for dormant grasses may well find a permanent place in turf-grass management.

Recently developed colorants from the chemical industry were tested in fall, 1957. Most gave good coloring to browning grass plots for two weeks after applications. Several maintained good to fair color up to eight weeks and may have lasted longer under ideal conditions.

All compounds tested exhibited little rub-off after drying.

In addition to offering a solution to brown winter lawns, the products may also be used to color disease-killed turf until replanting is possible, or turf brown from lack of water.

In using colorants, several points must be remembered, Dr. Youngner emphasized:

1. Even though the dormant, artificially colored grass may look quite fresh and green, it should be watered occasionally during periods of low rainfall.

2. Apply only enough colorant to thoroughly and uniformly cover the grass with a minimum of run-off.

3. Buy only colorants made by reliable companies. The good materials are designed only to economically color discolored grass until new growth begins. This is all a dependable manufacturer will claim to do.

Science News Letter, March 22, 1958

MEDICINE

U. S.-Sweden Team Study Cause of Newborn Death

► A JOINT RESEARCH project carried out by American and Swedish scientists may lead to a better understanding of respiratory malfunction in babies, the most common cause of newborn death.

The research is the first complete scientific record of a baby's first breath.

Dr. Forrest H. Adams of the University of California at Los Angeles Medical School, recently described "first breath" research to the Western Society for Clinical Research.

This research was carried out in collaboration with Drs. Petter Karlberg and John Lind of the Wenner-Gren Laboratory, Stockholm, Sweden.

Recordings of pressures within infants' chests during and after delivery and rapid serial X-rays of the lungs before and during the first few breaths were obtained. These suggested that a sudden expansion of the tiny lung capillaries may assist in the lung expansion associated with the first breath.

The sudden capillary expansion is thought to be related to changes occurring when blood flow through the umbilical cord to the infant is suddenly shut off.

There was generally no chest recoil in the baby immediately following the "big squeeze" of delivery. Some had thought this assisted lung expansion.

"The first breath is probably the most important breath we take in our lives since it may set the pattern for future lung action," Dr. Adams pointed out.

"Yet we know little about the conditions leading to it. As we learn more about the mechanisms involved, we may learn to prevent some of the many newborn deaths caused by lung collapse and other respiratory malfunctions," he said.

Science News Letter, March 22, 1958

MARINE BIOLOGY

Shell Pattern Identifies Old and New Barnacles

► "FINGERPRINTING" barnacles may turn out to be as successful a means of identifying these small sea animals as it is for humans.

It is very difficult to tell one species of barnacle from another just by their external appearance or shell. Usually it is necessary to dissect the animal and in cases where no soft body is present, as in a fossil, species identification is more difficult.

Now, however, the discovery of unique patterns that can be seen by cutting and polishing the cut edge of a shell provides a relatively easy and accurate means of identification.

Ira E. Cornwall of Victoria, British Columbia, reports in the current issue of the *Canadian Journal of Zoology* (Feb.) that even small or delicate fragments of a barnacle can be studied and identified. He has found that in many of the sessile barnacles studied, the pattern is the same in recent and fossil specimens.

Science News Letter, March 22, 1958

ASTRONOMY

Jupiter Now Most Prominent

April is the month that will see the planet Jupiter nearest to the earth, in addition to bringing the first solar eclipse of the year.

By JAMES STOKLEY

► IN A DIRECTION from the earth directly opposite to that of the sun on April 17, the giant planet Jupiter will make its closest approach of the year, at a distance of 413,000,000 miles. It will then be most prominent, visible all night with a brightness of minus two on the astronomical magnitude scale.

Jupiter is shown on the accompanying maps, which depict the sky as it appears about 10:00 p.m., your own kind of standard time, at the first of April, an hour earlier at the middle and two hours earlier at the end. It is toward the southeast, in Virgo, the virgin, just to the left of Spica, the brightest star in that constellation. Although Spica is among the 20 brightest stars in the sky (those of the first magnitude or brighter), Jupiter now surpasses it in brilliance by about 18 times.

High in the south, above and right of Virgo, you come to Leo, the lion, with another first-magnitude star. This is Regulus, which is in a group of six stars often called the "sickle," from its resemblance to that implement.

To the right of Leo is the rather faint constellation of Cancer, but next to that is the figure of Gemini, the twins. Here we find Pollux, also of magnitude one. Below Gemini is Canis Minor, the lesser dog, with Procyon, and below that stands the great dog Canis Major, with Sirius, the dog star. This is now so low that it is faint and relatively inconspicuous, quite different from the way it looked on midwinter evenings, when it was in the southern sky.

Orion is Faint

The same is true of Orion, to the west. Betelgeuse, the brightest star in this figure of the warrior, is shown; so are the three stars that mark his belt. However, Rigel, below the belt, has passed below the horizon. It may be seen earlier in the evening.

To the right of Orion is Taurus, the bull, in which we see Aldebaran. On account of its low altitude, and the consequent increased absorption of its light by the earth's atmosphere, it is represented by the symbol for a second-magnitude star, although it is really of the first. Above Taurus is Auriga, the charioteer, in which Capella shines.

High in the eastern sky, above and to the left of Jupiter, is the figure of Bootes, the bear-driver. Here we find Arcturus. Close to the northeastern horizon Vega, which is in Lyra, the lyre, is shown. Actually, of all the stars that can be seen from these latitudes, only Sirius surpasses Vega in bright-

ness, but as it is seen here you might not think so. Later in the night, as it climbs higher in the sky, it will be seen at full brilliance, as it will in the evenings later in the year.

Saturn, now in the constellation of Ophiuchus, the serpent-bearer, appears about midnight above the southeastern horizon. Hours later, or about two and a half hours before sunrise, Mars appears, in Capricornus, the sea-goat. Mars, red in color, is a little fainter than Saturn, although both are of the first magnitude. About half an hour later Venus appears, brighter even than Jupiter. Mercury, which appeared in the evening sky at the end of March, may be glimpsed in the first day or so of April, but you will have to look to the western sky, near the horizon, after sunset and even before dusk has faded, if you want to see it.

On April 3, at 10:45 p.m. EST, the moon will be full. This full moon will have a special significance, for it is the paschal moon, the one that determines the date of Easter.

It is commonly stated that Easter is the first Sunday following the first full moon after the vernal equinox, or the beginning of our spring in the Northern Hemisphere. The vernal equinox occurred on March 20 at 10:06 p.m., EST, when the sun passed

over the equator. The next full moon is on April 3, so the following Sunday, April 6, is Easter. And from the date of Easter are determined the dates of certain other religious "movable feasts."

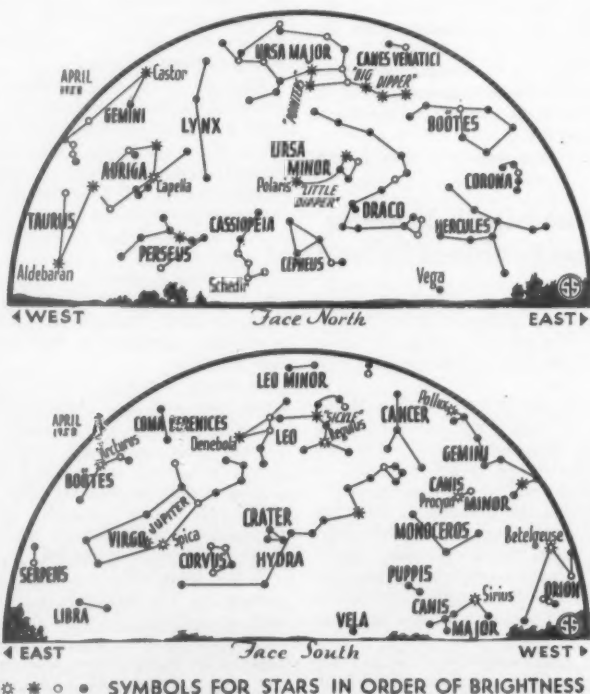
The Easter Moon

The Easter rule was set in 325 A.D. by the Council of Nicaea. Before that there were two principal factions in the early church with their own ideas as to when the festival should be celebrated.

The Crucifixion and Resurrection had taken place at the time of the Hebrew Passover, which begins on the 14th day of the month of Nisan in the Jewish calendar. Since each month in this calendar begins with the new moon, it is always full at the 14th. Hence when Christ arose from the dead it was a time of full moon and, also, it happened on a Sunday.

One group wanted to celebrate Easter always at the time of the full moon, but the others thought that the day of the week was important. They wanted it on Sunday, and the Nicene Council decided in their favor.

They fixed the rule that Easter should come on the Sunday following the 14th day of the moon when this came on or after March 21, which was the day of the equinox in 325. Actually, as this year, the equinox may occur on the 20th; sometimes it may come on the 22nd, while the full moon may not necessarily come on the 14th day of the lunar month. Thus, the rule



does not apply to the real moon, but represents an average. In 1818 and 1845, for example, the full moon came on Easter day, and caused considerable questioning from those who thought the rule applied to the body they saw in the sky.

First Eclipse of 1958

April also brings the first eclipse of 1958, but it will not be visible in any part of North America, except Alaska. This happens on April 18, when the new moon will come directly between earth and sun. However, the moon will be far enough away that it will appear slightly smaller than the sun and thus will not completely cover it.

Even where the solar eclipse is at its height, along a path that starts in the Indian Ocean, southwest of India, crosses Burma, Thailand, Viet Nam and Formosa and ends in the Pacific Ocean southeast of Japan, one would see a ring of the bright solar surface around the dark disc of the moon. Thus it is called an annular eclipse, since "annulus" is Latin for ring. Along the first part of this path it will be April 19 as the eclipse occurs. But the path crosses the International Date Line where it is still the 18th, so the event may be said to end the day before it begins!

Over a larger area, covering all of Asia except the northwestern part, the Indian Ocean, Indonesia and the western Pacific, as well as Alaska, there will be a partial eclipse, with the moon hiding a part of the sun. By our time reckoning, the eclipse occurs during the night of the 18th.

Celestial Time Table for April

April EST

3	4:00 p.m.	Moon nearest, distance 221,800 miles.
	10:45 p.m.	Full moon.
4	10:39 p.m.	Moon passes Jupiter.
8	6:00 p.m.	Venus farthest west of sun.
	9:10 p.m.	Moon passes Saturn.
10	6:50 p.m.	Moon in last quarter.
13	7:53 a.m.	Moon passes Mars.
16	2:00 p.m.	Mercury and sun in same direction.
	6:00 p.m.	Moon farthest, distance 252,500 miles.
17	2:00 a.m.	Jupiter in opposite direction from sun and nearest earth, distance 413,000,000 miles.
18	10:23 p.m.	New moon—annular eclipse of sun.
23	9:00 p.m.	Neptune in opposite direction from sun and nearest earth, distance 2,724,000,000 miles.
26	4:36 p.m.	Moon in first quarter.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, March 22, 1958

RADIO

Saturday, March 29, 1958, 1:30-1:45 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Leonard A. Scheele, president, Warner-Chilcott Laboratories, Morris Plains, N. J., will discuss "Safer Child-Birth."

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN VIRUS RESEARCH: Volume V—Kenneth M. Smith and Max A. Lauffer, Eds.—Academic, 376 p., illus., \$9.50. Reports of recent research.

AIR, WINDS, AND WEATHER—J. Myron Atkin and R. Will Burnett—Rinehart, 58 p., illus. with drawings by Raymond Perlman, paper, \$1. Simple experiments, simply described for elementary school pupils.

ARCTIC RIVIERA: A Book About the Beauty of Northeast Greenland—Ernst Hofer—Kimmerly & Frey, (Walter Pitkin), 127 p., illus., with photographs by the author, \$14.50. A book of breath-taking beauty containing information of especial interest to those concerned with the Arctic and the Geophysical Year.

THE BADGER—Ernest Neal—Penguin, 176 p., illus., paper, 85¢. Reporting the investigation of an English amateur naturalist into the private life secrets of this interesting animal.

BIOLOGY SERVING YOU—Charles Gramet and James Mandel—Prentice-Hall, 616 p., illus., \$4.96. A high-school text on living things.

BUZZTAIL: The Story of a Rattlesnake—Robert M. McClung—Morrow, 64 p., illus. with drawings by the author, \$2.50. Information about the timber rattlesnake prepared for children.

CAREER OPPORTUNITIES IN BIOLOGY: The Challenge of the Life Sciences—Russell B. Stevens—Nat. Acad. of Sciences—Nat. Res. Council, 63 p., illus., paper, \$1. To help the young student to match himself to a job truly appropriate to his personal inclinations and talents.

THE DEFORMATION OF THE EARTH'S CRUST: An Inductive Approach to the Problems of Diastrophism—Walter H. Bucher—Hafner, 518 p., illus., \$10. Authorized reissue of the original edition of 1933.

DOCTOR HARRY: The Story of Dr. Herman Lorber—Adam Barnett—Crowell, 180 p., \$3.50. Biography of an endearing family doctor who came to this country from Austria-Hungary at the age of 16.

ENERGY AND POWER—Robert Irving—Knopf, 143 p., illus. with drawings by Leonard Everett

Fisher, \$2.75. Explaining for young people how the world gets its work done.

ENGINEERS DID IT!—Duane Bradley—Lippincott, 121 p., illus. with drawings by Anne Marie Jauss, \$2.95. Describing for children great engineering works of the world.

EXPLORING THE DISTANT STARS: Thrilling Adventures in Our Galaxy and Beyond—Clyde B. Clason—Putnam, 384 p., illus., \$5. Written by a layman for other laymen and telling what astronomers have learned about the heavenly bodies without having to go up in a rocket.

FUNDAMENTAL PRINCIPLES OF TRANSISTORS—J. Evans—Van Nostrand, 255 p., illus., \$6.75. To give engineers and specialists sound basic knowledge of the subject quickly.

GEOLOGY OF BARRO COLORADO ISLAND, CANAL ZONE—W. P. Woodring—Smithsonian, 39 p., illus., paper, 65¢. This island is of particular interest because it has been a wildlife reservation since 1923 and is used as a field laboratory by many scientists.

HENRY HUDSON—Nina Brown Baker—Knopf, 146 p., illus. with drawings by George Fulton, \$2.50. Biography of the explorer written for young people.

HUMAN BIOCHEMISTRY—Israel S. Kleiner and James M. Orten—Mosby, 5th ed., 808 p., illus., \$9. For the student of medicine, dentistry and related disciplines.

THE HUMAN SUM—C. H. Rolph, Ed., preface by Lord Simon of Wythenshawe—Macmillan, 232 p., illus. with amusing drawings by Alfred G. Wurmser, \$3.75. Describing efforts toward family planning especially in England.

INTRODUCTORY PHYSICS: An Historical Approach—Herbert Priestley—Allyn, 515 p., illus., \$7.50. Showing the reader how some of the great scientists approached problems and what their results meant.

LONGER LIFE—George Soule—Viking, 151 p., \$3. An economist urges revision of our measures that tend to retire and isolate those over 65 thus depriving society of useful human resources.

MACROMOLECULES IN CELL STRUCTURE—A. Frey-Wyssling—Harvard Univ. Press, 112 p., illus., \$5. Tracing the structure of cytological objects.

NEW BIOLOGY: Number 25—M. L. Johnson, Michael Abercrombie and G. E. Fogg, Eds.—Penguin, 126 p., illus., paper, 65¢. The lead article is in celebration of the centenary of Karl Pearson.

THE OKLAHOMA SCIENCE EDUCATION STORY—James G. Harlow and Lyle M. Spencer—Thomas Alva Edison Foundation, 19 p., paper, single copies free upon request direct to publisher, 8 West 40th St., New York 18, N. Y. Describing a unique attempt to make the total citizenship concerned with improving science education.

OSTRICHES—Herbert S. Zim—Morrow, 64 p., illus. with drawings by Russell Francis Peterson, \$2.50. Telling children about these strange, long-legged birds.

OUR NUCLEAR FUTURE: Facts, Dangers and Opportunities—Edward Teller and Albert L. Latter—Criterion Bks., 184 p., illus., \$3.50. Telling laymen about the dangers of the atomic age.

THE PENTAERYTHRITOLS—Evelyn Berlow, Robert H. Barth and John E. Snow—Reinhold, 317 p., illus., \$10. Survey and evaluation of published literature covering preparation, properties and uses.

PETS FROM THE POND—Margaret Waring Buck—Abingdon, 72 p., illus. with drawings by the author, \$3. A book for children on how to collect and keep pond life.

PHYSICS OF FISSION: Supplement No. 1 Soviet Journal of Atomic Energy—In English Translation—S. M. Popova, Ed.—Atomic Press (Consultants Bureau), 140 p., diagrams, paper, \$30. Mostly reviews of experimental and theoretical work on the most important problems in the field.

A PRIMER FOR CORONARY PATIENTS—Robert J. Needles and Edith M. Stoney—Appleton, 176 p., illus., \$3.75. A practicing physician and a medical writer explain for the layman what the heart patient needs to know.

PRINCIPLES OF BIOLOGY—W. Gordon Whaley and others—Harper, 2d ed., 877 p., illus., \$6.75. A thoroughly revised edition of a text for students majoring in biological sciences as well as those taking only one course.

PRINCIPLES OF PHYSICAL CHEMISTRY: An Introduction to Their Use in the Biological Sciences—Wallace S. Brey, Jr.—Appleton, 433 p., illus., \$7. Intended to acquaint the biological scientist with the field of physical chemistry.

THE PROBLEM OF VOCABULARY IN THE POPULARISATION OF SCIENCE—W. E. Flood—Oliver and Boyd for University of Birmingham Institute of Education, 121 p., paper, 84¢. Listing words which the author believes the public should know in order to understand newspaper articles and radio or television talks about science. Based on experience in England, with an evident underestimation of the intelligence of the public. One idea is that foreigners must learn English to understand science.

RIVERS, MAN AND MYTHS: From Fish Spears to Water Mills—Robert Brittain—Doubleday, 288 p., illus., \$4.50. Telling of the effect of great rivers on the life and development of man.

SAFETY TECHNIQUES FOR RADIOACTIVE TRACERS—J. C. Boursnell—Cambridge Univ. Press, 68 p., \$1.75. Even the small quantities of radioactive isotopes used in microanalysis or tracer investigations can be a hazard to health unless safety measures are used.

SCIENCE AND THE MODERN WORLD VIEW—Gerald Holton, Ed.—Am. Acad. of Arts and Sciences, 140 p., quarterly, paper, \$1.75, \$6.50 a year. Published as the first quarterly issue of DAEDALUS, with contributions by Philipp Frank, Robert Oppenheimer, P. W. Bridgman, Howard Mumford Jones and others.

SCIENCE FOR ALL: An Annotated Reading List for the Non-Specialist—British Association for the Advancement of Science—National Book League (Cambridge Univ. Press), 177 p., \$2. To help the layman understand physical aspects of the world he lives in.

THE SCIENTIFIC PAPERS OF SIR GEOFFREY INGRAM TAYLOR: Volume I, Mechanics of Solids—G. K. Batchelor, Ed.—Cambridge Univ.

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Press, 593 p., illus., \$14.50. Some of the papers are previously unpublished.

TV AND OUR SCHOOL CRISIS—Charles A. Siepmann—Dodd, 198 p., \$3.50. Reporting on extensive studies of the possibilities of television as a teaching instrument.

THE THEORY OF THERMAL-NEUTRON NUCLEAR REACTORS: Supplement Nos. 2-3, Soviet Journal of Atomic Energy—In English Translation—A. D. Galanin—Atomic Press (Consultants Bureau), Part I, 191 p., Part 2 106 p., diagrams, paper, \$35 each part. Based on the work of Soviet scientists who have developed a theory of nuclear reactors independently of foreign authors.

A TREATISE ON PLANE AND ADVANCED TRIGONOMETRY—E. W. Hobson—Dover, 7th ed., 383 p., paper, \$1.95. Students' reprint of a classic.

THE TREE IDENTIFICATION BOOK: A New Method for the Practical Identification and Recognition of Trees—George W. D. Symonds—Barrows, illus. with photographs by Stephen V. Chelminski, \$10. Beautiful photographic keys help you to recognize trees from their leaves, flowers, fruit, bark and other features.

THE TRUE BOOK OF DESERTS—Elsa Posell—Childrens Press, 47 p., illus. with drawings by Carol Rogers, \$2. Telling children about the plants, animals and people who make their homes in the deserts.

THE TRUE BOOK OF OCEANS—Katharine Carter—Childrens Press, 47 p., illus. with drawings by Mary Gehr, \$2. For children.

WITCHCRAFT—Geoffrey Parrinder—Penguin, 208 p., paper, 85¢. A critical study of belief in witchcraft in Europe in years past and in Africa today.

THE WONDERFUL WORLD OF FOOD: The Substance of Life—John Boyd Orr—Garden City Bks., 69 p., illus., \$3.45. Tracing the development of man and his nourishment from the Old Stone Age.

THE WONDERFUL WORLD OF MEDICINE—Ritchie Calder—Garden City Bks., 69 p., illus., \$3.45. The story of man's quest for health from the days of primitive magic to modern public health and medical science.

Science News Letter, March 22, 1958

PSYCHOLOGY

"Brainstorming" No Aid To Creative Thinking

➤ "BRAINSTORMING," the modern technique of thinking aloud in groups used by advertising agencies and other businesses, does not aid creative thinking as has been claimed.

Instead, it actually hinders it.

This was found in an experiment at Yale University under the direction of Prof. Donald W. Taylor. In the experiment 96 Yale students attempted to solve three different problems. Some worked in groups of four persons and others worked alone.

Those who worked alone did better, not only in terms of the total number of ideas, but also in terms of the number of original and good ideas.

Results of the experiment are reported by Prof. Taylor and two of his graduate students, Paul C. Berry and Clifford H. Block, under the title "Does Group Participation When Using Brainstorming Facilitate or Inhibit Creative Thinking?"

Science News Letter, March 22, 1958

Snoring is due to vibrations in the soft palate and other structures of the throat in response to inflowing and outflowing air.

MINERALOGY

Recently Found Mineral Is Identified and Named

➤ A MINERAL that has puzzled scientists since a small quantity was first found 11 years ago in New Hampshire has been identified and named in honor of a German mineralogist by an American scientist.

The new mineral challenged identification and description of its properties until recent discovery of relatively rich specimens in Bavaria, Prof. Clifford Frondel of the department of mineralogy and petrography, Harvard University, Cambridge, Mass., reports in the German scientific journal *Naturwissenschaften* (Mid-Jan.).

Prof. Frondel named the new mineral strunzite, in honor of Dr. Hugo Strunz of Berlin, Germany.

Strunzite consists primarily of iron, manganese and phosphorus, with small amounts of magnesium and zinc. It ranges in color from straw yellow to brownish yellow and weighs about two and one-half times as much as water. Prof. Frondel says strunzite forms tufts and felted coatings of tiny hair-like crystals.

Science News Letter, March 22, 1958

MEDICINE

Radioactive Strontium Aids Study of Fractures

➤ STRONTIUM-90, the deadly, bone-seeking fallout product of nuclear bombs, has something helpful to contribute to medical science.

A new technique, developed by Dr. Norman S. MacDonald of the Atomic Energy Project at the University of California at Los Angeles, employs a medically safe close relative of strontium-90 to trace the body processes which maintain and repair the bone.

Previous studies had shown strontium-90 sought the bone and that its pathway through the body was almost identical to that of calcium. Thus strontium concentrated in the bone as calcium does.

However, the hazardous beta radiation of strontium-90 and its long radioactive lifetime made it unsuitable for use in bone studies of humans. But another form of radioactive strontium, strontium-85, which can be produced in a cyclotron, proved useful.

In the small amounts used in tracer studies strontium-85's radiation, gamma rays, was not harmful to humans, and had a short lifetime. Furthermore the "long range" gamma rays were suitable for external radiation recording techniques.

Thus strontium-85 could be injected into humans, its pathway through the blood stream and incorporation into bone traced. Such information is automatically recorded on a chart known as an osteogram.

Through use of the new technique it has been possible to follow the healing process in bone fractures. It is thought the technique also might be useful in study and diagnosis of bone diseases. Research in this area is underway, Dr. MacDonald said.

Science News Letter, March 22, 1958

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Questions

ASTRONOMY—When was the rule for setting the date on which Easter falls formulated? p. 186.

BIOCHEMISTRY—How does thrombin act on fibrinogen to form fibrin? p. 181.

MEDICINE—What relationship did overweight have in a study of 100 heart disease patients? p. 183.

TECHNOLOGY—How can heat be used to take pictures of an object? p. 184.

Photographs: Cover, Hughes Aircraft Company; p. 179, Harvard University; p. 181, British Information Services, Inc.; p. 183, West Virginia Pulp and Paper Company; p. 192, URB Products Corp.

EDUCATION

Engineering Enrollment Is at All-Time High

► THE NUMBER of engineering students in the nation's colleges is at an all-time high.

In the fall of 1957, there was a record number of 257,777 such students in 152 colleges in the United States and its possessions that have one or more curricula accredited by the Engineers' Council for Professional Development.

According to a survey made by the U. S. Office of Education and the American Society for Engineering Education, Urbana, Ill., this represents a 5.5% rise over the previous peak of 244,390 students reported in 1947.

The survey also shows:

1. Engineering enrollment has shown year-to-year increases since 1951.

2. Freshmen enrollments in the fall of 1957 were up one percent over the previous year and part-time and evening enrollments were up 17.1%.

3. Enrollment for the master's degree increased 7.6% between 1956 and 1957 and for the doctor's degree, "a substantial" 22.9%.

4. During the 1956-57 academic year 27,748 first-level engineering degrees, 5,203 master's degrees and 596 doctor's degrees were awarded. (There were 2.3% fewer Ph.D.'s granted in 1956-57 than in the previous academic year.)

5. Electrical engineering was the favorite in the bachelor, master's and post graduate pre-doctoral degrees granted, and chemical engineering for the doctor's degree.

Science News Letter, March 22, 1958

Do You Know?

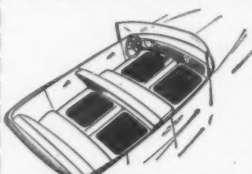
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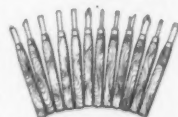


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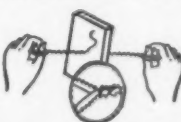
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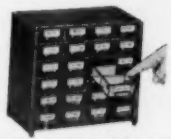
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Over \$15 value \$4.98
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No Gouges—No Burns—No Swirls

Sands Flat to Surface.
True Rotary Planer Action.



This fast, smooth attachment for your 1/4" electric drill will never leave a mark of any kind on your work. Just hold drill perpendicular to work and sand with invariable action—Sand-O-Plane does the real sanding with the action of a rotary planer—sands all directions of strain perfectly smooth. Ingenious new self-aligning cylinder allows movement of drill while disc still stays flat to surface. Holds twelve square inches of contact area. Kit consists of disc, ball joint, polishing bonnet and spare sandpaper.

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ppd.

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✿ **SHINGLE GAUGE** for both the amateur and professional roofer or carpenter spaces the rows accurately. The steel roofing help is designed to be taped onto any hammer and does not get in the way of nail pounding.

Science News Letter, March 22, 1958

✿ **PICTURE HANGER** is said to eliminate tilting, slipping and tipping. Made of aluminum, the hanger is almost two inches wide by one inch at its highest point. Near the top there are nail openings with a center slot arrangement.

Science News Letter, March 22, 1958

✿ **SPRINKLING CAN** made of polyethylene plastic has a non-leak, snap-on head for use as a garden sprinkler. When the head is removed, the plastic can fills car radiators, or potted plant holders. It has an eight-quart capacity.

Science News Letter, March 22, 1958

✿ **AIR MATTRESS** that can be made into a chaise lounge is made of heavy gauge plastic. The mattress, shown in the photograph, which comes complete with a small repair kit, adjusts to several positions. Lightweight for easy carrying to the beach or on a pic-



nic, the mattress measures 72 inches long and 30 inches wide.

Science News Letter, March 22, 1958

✿ **AUTOMATIC WRENCH** requires no other adjustment than turning the knurl which, when turned, holds the jaw openings fast so they cannot change position. Made of alloy steel, the wrench is available

in five sizes: four, six, eight, 10 and 12 inches.

Science News Letter, March 22, 1958

✿ **PICNIC TABLE AND BENCHES** for small fry are made from California redwood. Metal parts are rust and stain resistant. The set can be assembled by Dad without special tools. The table measures 14½ inches wide by 30 inches long and 15½ inches high.

Science News Letter, March 22, 1958

✿ **TRAVEL IRON** is for use anywhere in the world on AC current. The five-inch long, one and one-half pound traveling companion can be connected to 110 volt or 220 volt outlet. It has a dial-knob adjustment for different fabrics and a flashing red light to show when the proper temperature is reached.

Science News Letter, March 22, 1958

✿ **POWER MEGAPHONE** that has an effective range up to three-quarters of a mile is fully transistorized and battery-operated. Six ordinary flashlight cells drive the six transistor amplifier to provide 15 watts amplification. The unit weighs less than eight pounds.

Science News Letter, March 22, 1958



Nature Ramblings



By BENITA TALL

➤ A FISH SCALE and a cross section cut from a tree trunk are certainly very different. Yet, they have one characteristic in common.

Just as the rings on the cross section cut indicate the tree's age and growth patterns, the scales of a fish can be "read" to give much the same kind of information.

For scientists and conservationists this characteristic is very helpful, particularly for studying the sockeye salmon. Fish, unlike land animals, cannot be observed continuously throughout their lives and indirect means have to be used to study their life histories.

Except for the record provided by examining the fish's scales, it would be difficult, if not impossible, to tell under what environmental conditions the fish lives and reproduces.

Fish are not born with scales. Scales first

Telltale Scales



form on sockeye when they are about one and one-half inches long and the scales continue to grow with the fish. The salmon's one or two years of fresh water life is marked by a characteristic growth pattern which is followed by a period of slowed growth before the salmon's seaward migration.

Identifying fish through scale studies has a number of practical applications.

The catch of a particular "race" from a commercial hatchery can be identified. Also, the relationship between fresh water growth and salt water survival can be determined and hatchery workers can calculate the total production of one spawning through age analysis of salmon.

This kind of information is necessary for carrying out a successful program of fisheries management. Keeping a fish population up to normal, providing adequate protection during spawning runs, and maintaining a constant fishing intensity all are helped by greater knowledge of a fish's life history.

Sportsmen are benefited by better fishing, conservationists learn more about maintaining a "balance of nature" when stocking lakes and streams. Biologists gain information on the life cycle of a living creature.

The tiny fish scale has proved to be an extremely useful object.

Science News Letter, March 22, 1958

